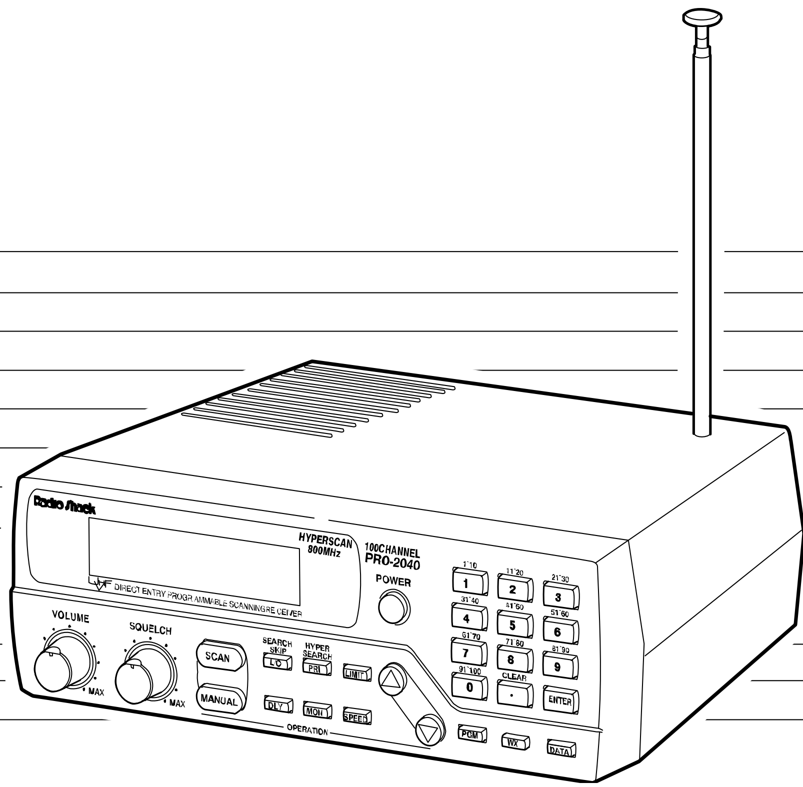
Cat. No. 20-414

OWNER'S MANUAL

PRO-2040

100-Channel Programmable Home Scanner

Please read before using this equipment.



Radio Shack

FEATURES

Your Radio Shack PRO-2040 100-Channel Programmable Home Scanner lets you in on all the action! This scanner gives you direct access to over 30,000 exciting frequencies that include police and fire departments, ambulance and transportation services, and amateur radio. You can select up to 100 channels to scan, and you can change your selections at any time.

The secret to your scanner's ability to scan so many frequencies is its custom-designed microprocessor — a tiny, built-in computer.

Your scanner also has these features:

Hyperscan — scans 50 channels per second.

Hypersearch — searches through frequencies at 300 steps per second in bands that have 5 kHz steps to help you find interesting broadcasts.

Ten 10-Channel Storage Banks — let you store 10 channels in each of 10 banks to group frequencies so you can easily identify calls.

Priority Channel — checks a specified channel every 2 seconds so you do not miss important calls.

Data Detection — you can set it to detect data signals (nonmodulated signals such as preamble signals for pagers) during a limit or a direct search so it can automatically continue searching.

Monitor Memories — let you store up to 10 frequencies you locate during a frequency search which you can then transfer into channels.

Search Function — searches for new and unlisted frequencies using a designated frequency range (limit search) or starting from a specified frequency (direct search).

Selectable Scan/Search Speeds — let you select normal or hyper scan speeds, and normal, high, or hyper search speeds.

Manual or Scan Channel Select — lets you manually specify a single channel or set the scanner to automatically scan all the stored channels.

Search Skip — lets you select up to 50 frequencies for the scanner to skip during a limit or direct search, so you can avoid unwanted frequencies.

Two-Second Scan Delay — delays scanning for 2 seconds before moving to another channel, so you can hear more replies.

Weather Band Key — scans the preprogrammed weather frequencies to keep you informed of the most current weather conditions.

Memory Backup — keeps the channel frequencies stored in your scanner's memory for up to 3 days during a power loss.

Squelch Control — lets you adjust the receiver's sensitivity low enough to receive weak signals or high enough to eliminate receiver noise when not receiving a signal.

Lock-Out Function — prevents channels you select from being scanned.

Backlit LCD Display — lets you easily see the indicators on the scanner's display, even at night.

Audio Output Jack — lets you connect an earphone or headphones for private listening, or an external speaker for listening in a remote or noisy area.

Optional Antenna Terminals — let you connect the supplied telescoping antenna to the screw-in terminal, or an external antenna to the BNC connector.

Optional Power Sources — let you power your scanner using the supplied AC adapter or an optional DC adapter.

Warning: To prevent fire or shock hazard, do not expose this system to rain or moisture.

CAUTION

RISK OF ELECTRIC SHOCK.
DO NOT OPEN.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER OR BACK. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

This symbol is intended to alert you to the presence of uninsulated dangerous voltage within the scanner's enclosure that might be of sufficient magnitude to constitute a risk of electric shock. Do not open the scanner's case.

This symbol is intended to inform you that important operating and maintenance instructions are included in the literature accompanying this scanner.

For your records, please record your scanner's serial number in the space provided. The serial number is located on the back of the scanner.

Serial Number: ____________________

Your PRO-2040 can receive these bands:

Band	Modulation	Frequency Range	Frequency Step
10-Meter Ham Band	FM	29.00-29.7 MHz	5.0 kHz
VHF-Lo	FM	29.7-50.00 MHz	5.0 kHz
6-Meter Ham Band	FM	50.00-54.00 MHz	5.0 kHz
Aircraft	AM	108-136.975 MHz	12.5 kHz
Government/Ham	FM	137-148 MHz	5.0 kHz
VHF-Hi	FM	148-174 MHz	5.0 kHz
Ham/Government	FM	406-450 MHz	12.5 kHz
UHF-Lo	FM	450-470 MHz	12.5 kHz
UHF-T (TV)	FM	470-512 MHz	12.5 kHz
UHF-Hi	FM	806-823.9375 MHz	12.5 kHz
UHF-Hi	FM	851- 868.9375MHz	12.5 kHz
UHF-Hi	FM	896.1125-956 MHz	12.5 kHz

FCC Notice

Your scanner might cause radio or TV interference even when it is operating properly. To determine if your scanner is causing the interference, turn off your scanner. If the interference goes away, your scanner was causing it. Try to eliminate the interference by:

- Moving your scanner away from the receiver
- Connecting your scanner to an outlet that is on a different electrical circuit from the receiver
- Contacting your local Radio Shack store for help

If you cannot eliminate the interference, the FCC requires that you stop using your scanner.

Note: Mobile use of this scanner is unlawful or requires a permit in some areas. Check the laws in your area.

This device complies with Part 15 of *FCC Rules*. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

CONTENTS

Scanning Legally

Scanning is a fun and interesting hobby. You can hear police and fire departments, ambulance services, government agencies, private companies, amateur radio services, aircraft, and military operations. It is legal to listen to almost every transmission your scanner can receive. However, there are some electronic and wire communications that are illegal to intentionally intercept. These include:

- Telephone conversations (cellular, cordless, or other private means of telephone signal transmission)
- Pager transmissions
- Scrambled or encrypted transmissions

According to the Federal Electronic Communications Privacy Act (ECPA), as amended, you could be fined and possibly imprisoned for intentionally listening to, using, or disclosing the contents of such a transmission unless you have the consent of a party to the communication (unless such activity is otherwise illegal). These laws change from time to time and there might be state or local laws that also affect legal scanner usage.

PREPARATION

CONNECTING POWER

Using Standard AC Power

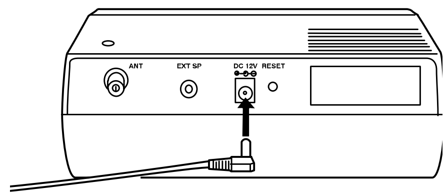
You can power your scanner from a standard AC outlet using the supplied AC adapter.

Warning: Do not use the AC adapter's polarized plug with an extension cord receptacle unless the blades can be fully inserted to prevent blade exposure.

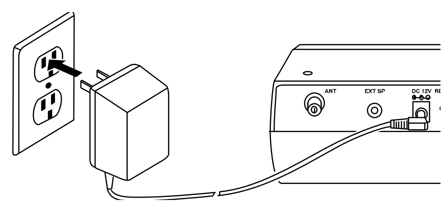
Cautions:

- The supplied AC adapter supplies 12 volts and delivers 500 milliamps. Its center tip is set to positive, and its plug properly fits the scanner's **DC 12V** jack. Using an AC adapter that does not meet these specifications could damage the scanner or the adapter. The scanner's display dims if the AC adapter you use does not provide the required 12 volts DC.
- Be sure you connect the AC adapter to the scanner before you connect it to a standard AC outlet. Then disconnect the adapter from the AC outlet before you disconnect it from the scanner.
- If you have difficulty inserting the AC adapter's polarized plug, do not force it. Turn it over and reinsert it.

1. Insert the supplied AC adapter's barrel plug into the scanner's **DC 12V** jack.



2. Plug the adapter's power module into a standard AC outlet.



Memory Backup

If a power failure occurs or if the power cord is disconnected, the scanner's memory backup circuit keeps information in memory for up to 3 days.

Note: The memory backup circuit begins to protect the contents in memory within a few minutes after you plug in the scanner.

Using Vehicle Battery Power

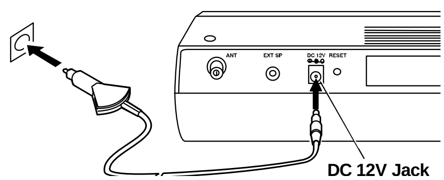
To power your scanner from your vehicle's battery power, you need a DC power cord (such as Radio Shack Cat. No. 270-1533).

Cautions:

- Your vehicle must have a 12-volt DC, negative-ground electrical system.
- The recommended DC power cord supplies 12 volts and delivers at least 500 milliamps. The center tip on the barrel plug is set to positive, and the plug properly fits the scanner's **DC 12V** jack. Using a DC power cord (or adapter) that does not meet these specifications could damage the scanner or the cord (or adapter). The scanner's display dims if the DC cord (or adapter) you use does not provide the required 12 volts DC.
- Be sure you connect the DC cord to the scanner before you connect it to the vehicle's cigarette-lighter plug. Then disconnect the cord from the vehicle's cigarette-lighter plug before you disconnect it from the scanner.

Follow these steps to use vehicle battery power.

1. Insert the barrel plug into the scanner's **DC 12V** jack.
2. Plug the other end of the adapter into your vehicle's cigarette-lighter socket.



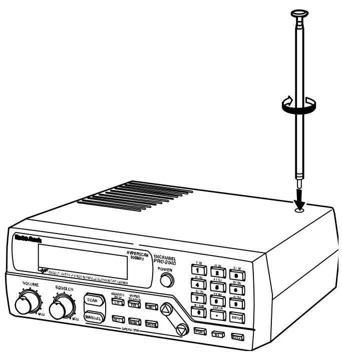
Note: If the scanner does not operate properly when you use a DC cord (or adapter), unplug the cord (or adapter) from the lighter socket and clean the socket to remove ashes and other debris.

CONNECTING AN ANTENNA

You can connect either the supplied telescoping antenna or an optional antenna.

Telescoping Antenna

To attach the telescoping antenna, simply screw it into the hole on top of your scanner.



The antenna's length controls its sensitivity. Adjust the length of the telescoping antenna as follows for the best reception.

29-54 MHz	Extend all 3 segments
108-174 MHz	Extend only 2 segments
406-956 MHz	Collapse Fully (only 1 segment extended)

Optional Outdoor Antenna

The supplied antenna is usually adequate for strong, local signals. However, for the best results in receiving weaker, more distant signals on all bands, you can attach an optional outdoor antenna (not supplied), such as a mobile, telescoping, multi-band, or outdoor base antenna.

Warning: When installing or removing an outdoor antenna, follow all cautions and warnings included with the antenna.

Notes:

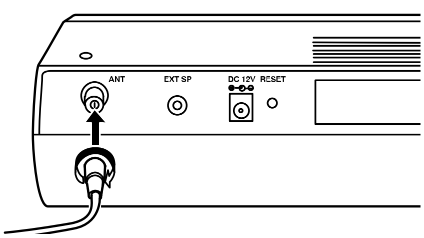
- This scanner uses a BNC antenna connector. If the coaxial cable's connector does not fit the **ANT** jack, you might also need an adapter. Your local Radio Shack store sells a complete line of outdoor antennas, adapters, BNC connectors, and mounting hardware.
- Always use 50-ohm coaxial cable to connect an outdoor antenna. For lengths under 50 feet, use RG58 (Cat. No. 278-1314) or RG8/M (Cat. No. 278-1313). For lengths over 50 feet, use RG-8, low-loss coaxial cable (Cat. No. 278-1312).

For the best performance, consider the following when deciding on an outdoor base antenna and its location:

- The location of the external antenna should be as high as possible.
- The external antenna and antenna cable should be as far away as possible from sources of electrical noise (appliances, other radios, and so on).
- The external antenna should be vertical.

Mount the antenna following the instructions supplied with the antenna and its mounting hardware, then follow these steps to connect an external antenna.

1. Route the antenna cable to the scanner and connect it to the **ANT** jack on the back of the scanner.



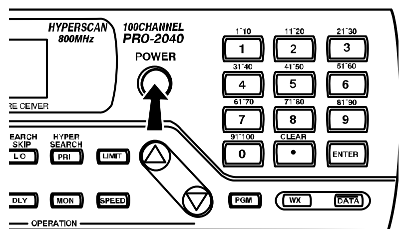
   Caution: Do not route the cable over sharp edges or moving objects.

2. Remove the supplied antenna from the top of the scanner.

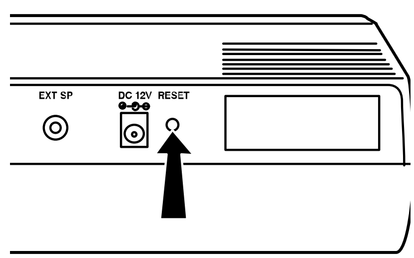
RESETTING THE SCANNER’S DISPLAY

If the scanner’s display locks up after you connect a power source, follow these steps to reset it.

1. If the scanner is off, press **POWER** to turn it on.



2. Using a pointed object, such as a straightened paper clip, press **RESET** on the back of the scanner. The display resets, and the scanner turns off.



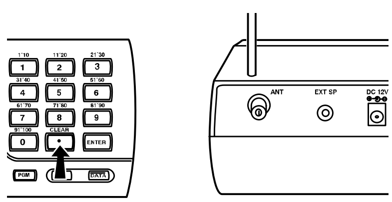
3. Press **POWER** to turn on the scanner again.

INITIALIZING THE SCANNER

If the scanner or its display does not work properly even after resetting it, follow these steps to initialize the scanner.

Caution: Initializing the scanner clears all the channels you stored in memory. Initialize the scanner only when you are sure it is not working properly.

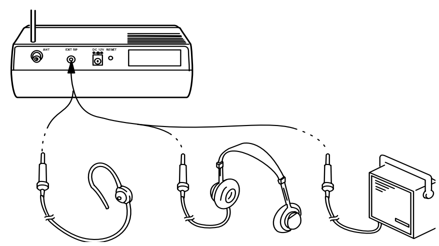
1. If the scanner is off, press **POWER** to turn it on.
2. Press and hold **./CLEAR**, then press **RESET** on the back of the scanner using a pointed object, such as a straightened paper clip. The display resets, and the scanner turns off.



3. Press **POWER** to turn on the scanner.

CONNECTING AN EARPHONE/ HEADPHONES/ EXTERNAL SPEAKER

The $^1/_8$-inch **EXT SP** jack on the back of the scanner lets you connect an earphone, headphones, or an external speaker.



- For private listening, connect an earphone (Cat. No. 33-175).
- For more comfortable private listening, connect monaural headphones (Cat. No. 20-210).
- For listening from a remote area or in a noisy area, connect an extension speaker (Cat. No. 21-549).

Note: Connecting any external device to the **EXT SP** jack automatically disconnects the internal speaker.

Listening Safely

To protect your hearing, follow these guidelines when you use an earphone or headphones.

- Do not listen at extremely high volume levels. Extended high-volume listening can lead to permanent hearing loss.
- Set the volume to the lowest setting before you begin listening. After you begin listening, adjust the volume to a comfortable level.
- Once you set the volume, do not increase it. Over time, your ears adapt to the volume level, so a volume level that does not cause discomfort might still damage your hearing.

Traffic Safety

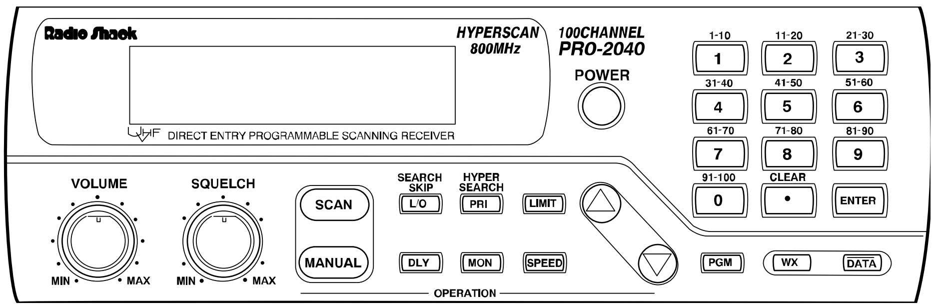
Do not wear an earphone or headphones while operating a motor vehicle or riding a bicycle. This can create a traffic hazard and is illegal in some areas.

Even though some earphones are designed to let you hear some outside sounds when listening at normal volume levels, they still present a traffic hazard.

UNDERSTANDING YOUR SCANNER

A LOOK AT THE FRONT PANEL

This look at the scanner's front panel will help you understand each control's function.

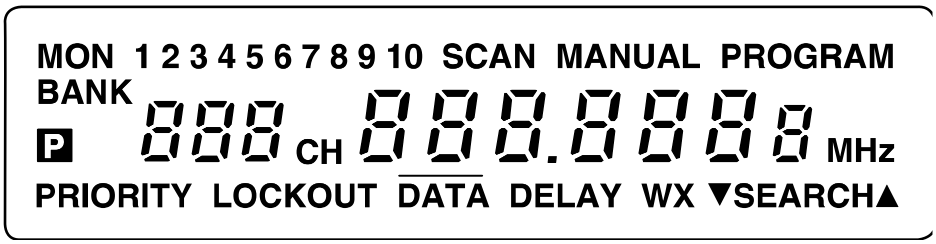


Control	Function
POWER	Turns the scanner on and off.
1-0	Each single-digit number on the keys enters the numbers for a channel or a frequency, or each range of numbers above the number keys indicates the channels that make up a channel-storage bank. See "Understanding Channel-Storage Banks."
./CLEAR	Enters the decimal point in a frequency, or clears an incorrect entry and is used when you initialize the scanner.
ENTER	Enters programmed frequencies into channels.
VOLUME	Sets the scanner's volume.
SQUELCH	Adjusts the scanner's receiver sensitivity to help you eliminate background noise.
SCAN	Starts scanning through the stored channels.
MANUAL	Stops scanning and lets you manually enter a channel number.

Control	Function
L/O/SEARCH SKIP	Turns the selected channel's lockout function on and off, or skips a specified frequency during a limit or direct search.
PRI/HYPER SEARCH	Sets and turns on and off the priority function for a particular channel, or selects the hyper search speed.
LIMIT	Used to set the lower or upper limit during frequency searches.
DLY	Programs a 2-second delay for the selected channel.
MON	Stores frequencies into and accesses the 10 monitor memories.
SPEED	Changes the scanning or search speed. See "Scanning and Search Speeds."
D - —	Enters the up or down direction in the search mode.
PGM	Programs frequencies into channels.
WX	Searches through the seven preprogrammed weather channels.
DATA	Turns the data skip feature on and off.

A LOOK AT THE DISPLAY

The display has several indicators that show the scanner's current operating mode.



Indicator	Function
MON	Appears when you listen to a monitor memory.
BANK	Appears with numbers (1-10) to the right to show which channel-storage banks are turned on for the scan mode. See "Understanding Channel-Storage Banks."
SCAN	Appears when you scan channels. Blinks when the scanner is in the hyperscan mode.
MANUAL	Appears when you manually select a channel.
PROGRAM	Appears while you program frequencies into the scanner's channels.
CH	Digits that precede this indicator show which channel the scanner is currently tuned to.
MHz	Digits that precede this indicator show which of the 31,000 possible frequencies the scanner is tuned to.
P	Appears when you listen to the priority channel.
PRIORITY	Appears when you turn on the priority channel feature.

Indicator	Function
LOCKOUT	Appears when you manually select a locked channel, or during a search hold when the frequency is stored in search skip memory.
$\overline{\textbf{DATA}}$	Appears while the data skip function is turned on.
DELAY	Appears when you program a channel for a two-second delay before scanning or when you listen to a channel programmed with the delay feature.
WX	Appears when the scanner is in the weather band mode.
s **and** t	Indicates the search direction. Blinks in high speed search mode.
SEARCH	Appears during a limit (**-L-** also appears) or direct search (**-d-** also appears) or weather scan. Blinks in hyper search mode.
Error	Appears when you make an incorrect keyboard entry.
Lo	Appears when you program the low limit for a frequency search.
Hi	Appears when you program the high limit for a frequency search.
-h-	Appears during a direct search hold.
-H-	Appears during a limit search hold.

UNDERSTANDING THE SCANNER'S MEMORY

You can store up to 110 frequencies into your scanner's memory. You store each frequency into either a memory called a channel, or a temporary memory called a monitor. This scanner has 100 channel memories and 10 monitor memories.

Channel-Storage Banks

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 channel-storage banks of 10 channels each. Use each channel-storage bank to group frequencies, such as the police department, fire department, ambulance services, or aircraft (see "A Guide to the Action Bands").

For example, the police department might use four frequencies, one for each side of town. You could program the police frequencies starting with Channel 1 (the first channel in Bank 1) and program the fire department starting with Channel 11 (the first channel in Bank 2).

Monitor Memories

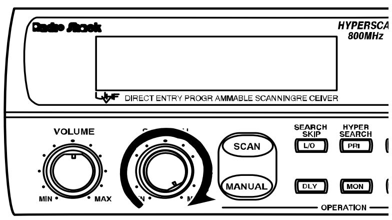
The scanner has 10 monitor memories. You can use these memories to temporarily store frequencies while you decide whether or not to store them into channels. This is handy for quickly storing an active frequency when you search through an entire band. You can manually select these memories, but you cannot scan them. See "Searching For and Temporarily Storing Active Frequencies."

When you are in the monitor mode, one of the memory numbers (1-10) appears to the right of the MON indicator. The number indicates the current monitor memory.

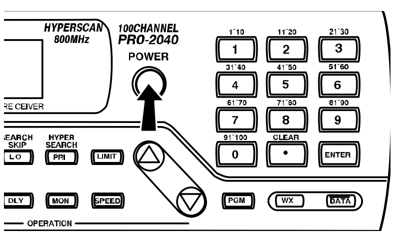
OPERATION

TURNING ON THE SCANNER/SETTING THE VOLUME AND SQUELCH

1. Turn **SQUELCH** fully clockwise.

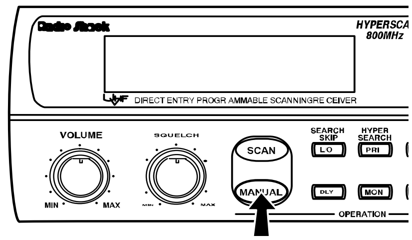


2. Press **POWER** to turn on your scanner. The scanner continuously scans the unlocked channels.

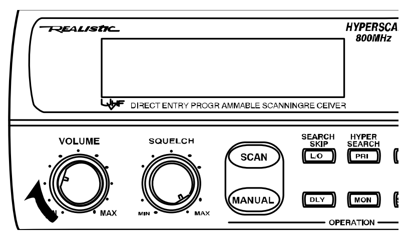


Note: The first time you turn on the scanner, the channels might not have any frequencies stored in them, but the scanner will continuously scan the empty channels anyway.

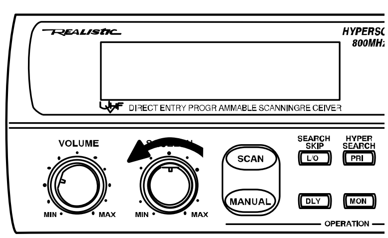
3. Press **MANUAL** to stop the scanning. The display shows the current channel.



4. Turn **VOLUME** clockwise to set the scanner's volume about 1/4 of the way between **MIN** and **MAX**.



5. Turn **SQUELCH** counterclockwise until you hear a hissing noise.



6. Adjust **VOLUME** to a comfortable level.
7. Slowly turn **SQUELCH** clockwise until the hissing noise stops.

Squelch Tips:

- If the scanner picks up unwanted or weak transmissions, slightly turn **SQUELCH** clockwise to decrease receiver sensitivity.
- If the scanner does not pick up any transmissions, slightly turn **SQUELCH** counterclockwise to increase receiver sensitivity.

FINDING BIRDIE FREQUENCIES

Birdies are operating frequencies generated and used inside the scanner's receiver. These operating frequencies could interfere with broadcasts on the same frequencies and make them difficult or impossible to receive.

These are the most common birdies to watch for:

31.0500 MHz	134.550 MHz
127.2500 MHz	136.050 MHz
128.1875 MHz	138.050 MHz
128.2500 MHz	140.275 MHz
129.6875 MHz	144.900 MHz
132.0500 MHz	171.250 MHz
132.2625 MHz	

If you store one of these frequencies into a channel, you might hear only noise when the scanner stops on that frequency. If the interference is not severe, you might be able to turn **SQUELCH** clockwise to cut out the birdie.

To find your scanner's specific birdies:

1. Disconnect the antenna and move it away from the scanner.

   Note: Make sure that no other nearby radios or TVs are turned on.

2. Search every frequency band from its lowest frequency to the highest (see "Searching For and Temporarily Storing Active Frequencies").

If searching stops (as if the scanner had found a signal) but there is no sound, that frequency might be a birdie.

For future reference, record all the birdies in your particular scanner.

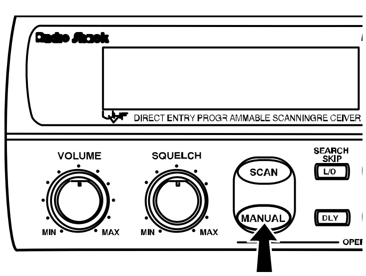
MANUALLY STORING FREQUENCIES IN CHANNELS

You can manually store up to 100 frequencies into your scanner's channels. Radio Shack sells some good references for active frequencies, such as "Police Call Radio Guide Including Fire and Emergency Services," "Official Maritime Frequency Directory" and "Official Aeronautical Frequency Directory."

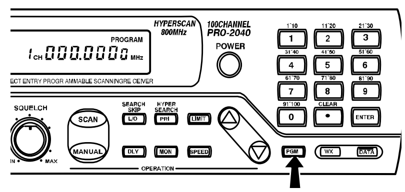
Radio Shack updates these directories every year, so be sure to get a current copy. If you do not have a reference to frequencies in your area, you can use a limit or direct search to find a transmission.

Follow these steps to manually store frequencies.

1. Press **MANUAL** to stop the scanning.



2. Enter the channel number where you want to store a frequency.
3. Press **PGM**. **`000.0000MHz`** **`PROGRAM`**, **`BANK`**, the bank number and the selected channel number appear on the display.



4. Enter the frequency you want to store, including the decimal point.

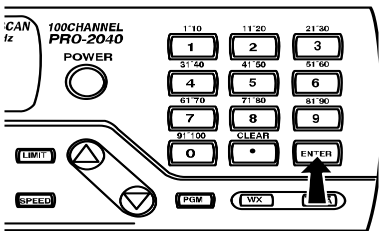
   Notes:

   - Frequencies are separated from each other in the following steps:

Frequencies	Steps
29.0-108.0 MHz	5 kHz
108-136.975 MHz	12.5 kHz
137.0-300.0 MHz	5 kHz
300-3000 MHz	12.5 kHz

   - When you enter a frequency, the scanner automatically rounds it to the nearest valid number. For example, if you enter the frequency 151.473, your scanner rounds it up to 151.475.

5. Press **ENTER** to store the frequency into the selected channel.



Note: If you made a mistake in Step 4, `Error` appears on the display. Repeat Steps 4 and 5.

6. To program the next channel in sequence, repeat Steps 3-5.

   To program other channels not in sequence, repeat Steps 2-5.

SEARCHING FOR AND TEMPORARILY STORING ACTIVE FREQUENCIES

You can search for frequencies using a limit or direct search, then either skip selected frequencies or temporarily store frequencies into monitor memories.

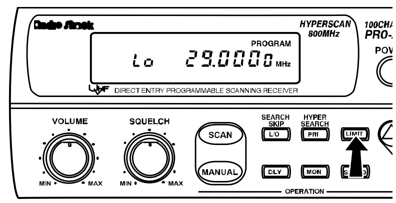
Limit Search

A limit search lets you search for active transmissions within a specified range of frequencies.

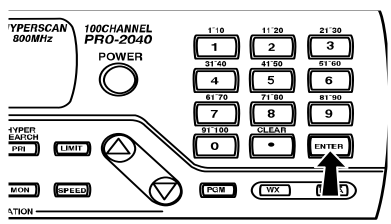
Note: You can use the scanner's delay feature while using limit search (see "Delay").

Follow these steps to search for active frequencies.

1. Press **PGM**, then **LIMIT**. `Lo` and a frequency appear on the display.

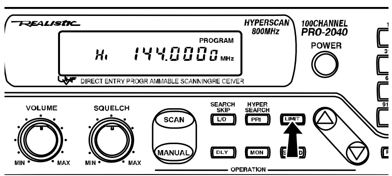


2. Using the number keys, enter the lowest frequency (including the decimal point) you want to search within the desired frequency range, then press **ENTER**.

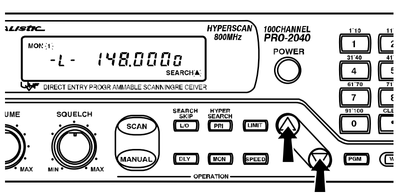


Note: If you enter an invalid frequency, `Error` appears on the display. To correct this, simply repeat the step.

3. Press **LIMIT**. **Hi** and a frequency appear on the display.



4. Using the number keys, enter the highest frequency you want to search within the desired frequency range, then press **ENTER**.
5. Press D to search upward from the lower to the upper limit, or press — to search downward from the upper to the lower limit. **-L-**, **SEARCH**, and s or t appear, and the next available monitor memory flashes on the display.



6. When the scanner finds an active frequency you want to monitor, you can do one of the following:
   - To store the displayed frequency into the current monitor memory, quickly press **MON**.
   - To continue the search, press D or —.

To hold the frequency, press **LIMIT**. **-H-** appears on the display.

Press **LIMIT** again to exit the hold mode and resume the limit search.

Notes:

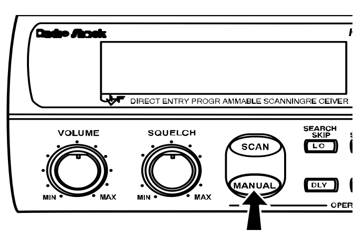
- If you press D or — during the hold mode, the frequency changes in the current step increment toward the upper or lower limits.
- If you tune to a search skip frequency, the display shows **LOCKOUT** (see “Search Skip Memory”).

Direct Search

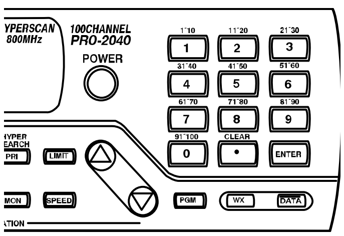
A direct search lets you specify a starting frequency, then search for active transmissions above or below the specified frequency.

Note: You can use the scanner’s delay feature while using direct search (see “Delay”).

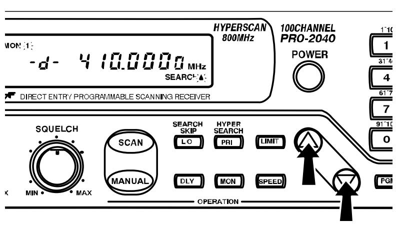
1. Press **MANUAL**.



2. Using the number keys, enter the frequency (including the decimal point) you want to start the search from, or the channel number containing the starting frequency, then press **MAN** or **PGM** to select the channel.



3. Press D to search up or — to search down starting from the specified frequency or channel. **-d-**, **SEARCH**, and s or t appear, and the next available monitor memory flashes on the display.



Note: If you enter an invalid frequency, **Error** appears on the display. To correct this, repeat Steps 2 and 3.

4. When the scanner finds an active frequency you want to monitor, you can do one of the following:
   - To store the frequency into the current monitor memory, press **MON**.
   - To continue the search, press D or —.
   - To hold the frequency, press **LIMIT**. **-h-** appears on the display.
   - Press **LIMIT** again to exit the hold mode and resume the direct search.

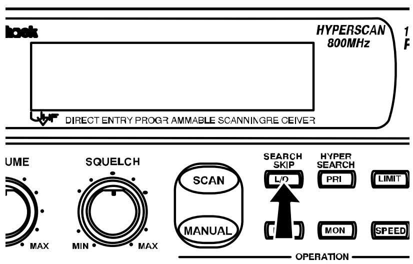
   Notes:

   - If you press D or — during the hold mode, the frequency changes in the current step increment toward the upper or lower limits.
   - If you tune to a search skip frequency, the display shows **LOCKOUT** (see "Search Skip Memory").

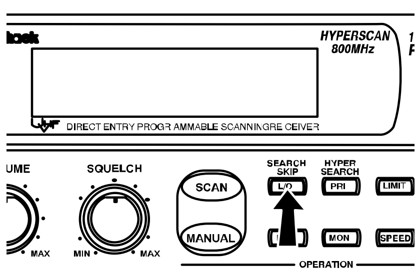
Search Skip Memory

You can skip specified frequencies during a limit or direct search. This lets you avoid unwanted frequencies or ones you have already stored in a channel. You can program up to 50 skip frequencies into the scanner's memory.

To skip a frequency, press **L/O/ SEARCH SKIP** when the scanner stops on the frequency during a limit or direct search.



To clear a single frequency from skip memory so the scanner can stop on it during a limit or direct search, press **LIMIT** to hold the search, press D or ── to select the skipped frequency, then press **L/O/SEARCH SKIP** until `LOCKOUT` disappears from the display.



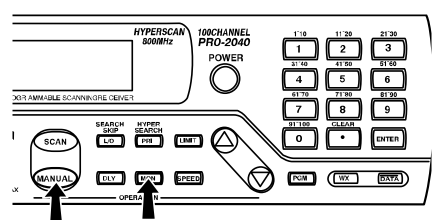
To clear all the skip frequencies at once, while in the search mode, press and hold **L/O/SEARCH SKIP** until the scanner beeps twice.

Notes:

- If you program more than 50 skip frequencies, each new frequency replaces earlier ones, starting from the first stored frequency.
- You can select the skipped frequency when the scanner is in the hold mode. The scanner displays `LOCKOUT` when you select a skipped frequency.

LISTENING TO MONITOR MEMORIES

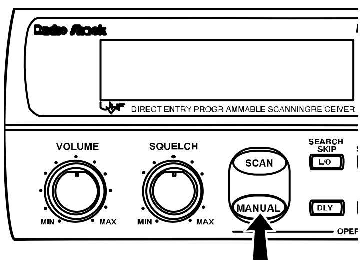
After you temporarily store frequencies into the scanner's monitor memories, you can listen to them by pressing **MANUAL**, **MON**, then the number for the monitor memory you want to listen to.



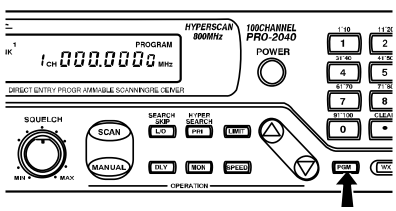
Note: To listen to the monitor memories, the priority channel feature must be turned off (see "Designating a Priority Channel").

MOVING A FREQUENCY FROM A MONITOR MEMORY TO A CHANNEL

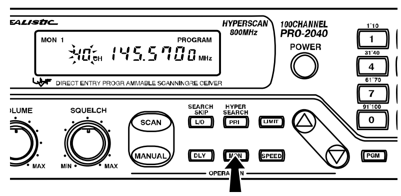
1. Press MANUAL to stop the scanning.



2. Enter the channel number where you want to store the monitor frequency, then press **PGM**. **PROGRAM** appears on the display.



3. Press **MON**, then enter the monitor memory number that has the frequency you want to store into the channel. **MON** and the entered frequency appear, and the channel number blinks on the display.



4. Press **ENTER**. The scanner stores the frequency into the selected channel.

SCANNING THE STORED CHANNELS

To scan the stored channels, press **SCAN**. Your scanner scans through all the stored channels except the ones you lock out (see "Locking Out Channels").

If needed, readjust **SQUELCH** so you do not hear the hissing sound between transmissions.

Turning Channel-Storage Banks On and Off

You can set your scanner to scan more efficiently by turning selected channel storage banks on and off. When you turn off a bank, the scanner does not scan any of the 10 channels in the bank.

While scanning, press the number key corresponding to the bank you want to turn on or off. If the memory bank indicator is on, the bank is turned on and the scanner scans all channels within that bank that are not locked out. If the indicator is off, the scanner does not scan any of the channels within that bank.

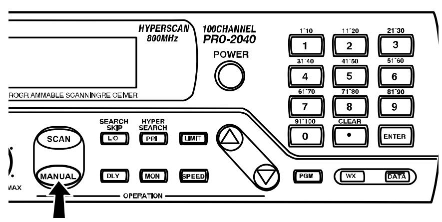
Notes:

- You can manually select any channel in a bank, even if the bank is turned off.
- You cannot turn off all banks. There must be at least one active bank.

MANUALLY SELECTING A CHANNEL

You can continuously monitor a specific channel without scanning. This is useful if you hear an emergency broadcast on a channel and want to hear all the details (even though there might be periods of silence) or if you want to monitor only a specific channel or a locked-out channel.

To manually select a channel, press **MANUAL**, enter the channel number, then press **MANUAL** again.



If scanning has stopped at the desired channel, simply press **MANUAL** once.

Repeatedly press **MANUAL** to step through the channels one at a time.

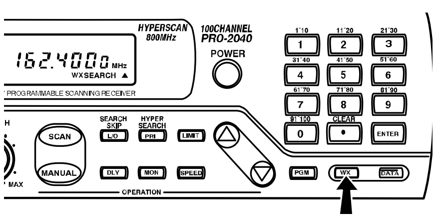
LISTENING TO THE WEATHER BAND

The FCC (Federal Communications Commission) has allocated 11 channels for use by the National Oceanic and Atmospheric Administration (NOAA).

Your scanner is preprogrammed with the following frequencies available to NOAA.

162.400 MHz	162.500 MHz
162.425 MHz	162.525 MHz
162.450 MHz	162.550 MHz
162.475 MHz	

To hear your local forecast and regional weather information, simply press **WX**. **WX** appears on the display.



Your scanner searches through the weather band and stops on an active broadcast. If a broadcast is weak, press **WX** again to continue to search through the weather band.

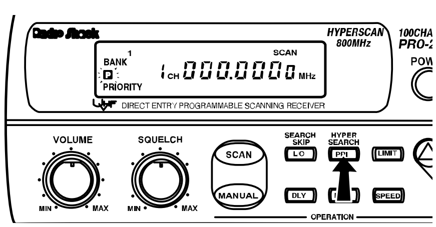
DESIGNATING A PRIORITY CHANNEL

By designating a priority channel, you can scan through the programmed channels and still not miss an important or interesting call on a specific channel.

Note: You can select only one channel as the priority channel.

To program a stored channel as the priority channel, press **PGM**, the desired stored channel number, then **PRI/HYPER SEARCH**. **P** appears on the display.

To turn on the priority feature, press **PRI/HYPER SEARCH** during scanning. **PRIORITY** appears on the display. The scanner now checks the priority channel every 2 seconds, and stays on the channel if there is activity. **P** appears on the display whenever the scanner is set to the priority channel.

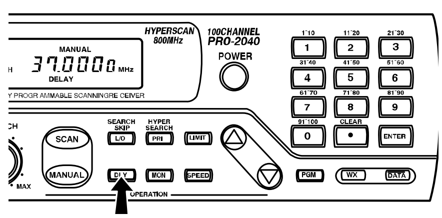


To turn off the priority feature, press **PRI/HYPER SEARCH** until **PRIORITY** disappears from the display.

USING THE 2-SECOND DELAY

Many agencies use a two-way radio system that might have a period of several seconds between a query and a reply. To avoid missing a reply, you can program a 2-second delay into any channel. When the scanner stops on an active channel with a programmed delay, it continues to monitor the channel for 2 seconds after the activity stops before resuming scanning.

To program a 2-second delay into a specific channel, manually select the desired channel then press **DLY**. **DELAY** appears on the display.



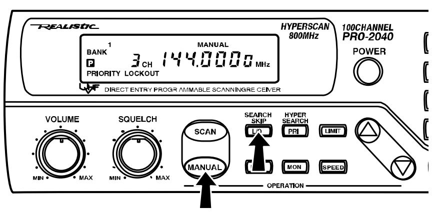
To program a 2-second delay when the scanner stops on an active channel during scanning, quickly press **DLY** while the channel is still active. **DELAY** appears on the display.

To turn off the programmed delay on any active channel, press **DLY** while the channel is still active. **DELAY** disappears from the display.

LOCKING OUT CHANNELS

You can set your scanner to scan more efficiently by locking out channels you do not want to monitor. This is handy for locking out channels where you stored a frequency with a continuous transmission, such as a weather channel.

To lock out a channel, press **MANUAL**, enter the desired channel number, press **MAN** or **PGM** to select the channel, then press **L/O/SEARCH SKIP** so **LOCKOUT** appears on the display.



Notes:

- You can still manually select locked out channels.
- You cannot lock out all channels. There must be at least one active channel in each bank.

To unlock a channel, manually select the channel, then press **L/O/SEARCH SKIP** so **LOCKOUT** disappears from the display.

To unlock all channels, while the scanner is scanning, select the banks containing the locked channels you want to unlock, press **MANUAL**, then press and hold **L/O/SEARCH SKIP** until the scanner beeps twice.

CHANGING SCANNING AND SEARCH SPEEDS

The PRO-2040 has two scan and three search speeds.

Type	Speed
Normal Scan	12 channels/second
Hyper Scan	50 channels/second
Normal Search	50 steps/second
High Speed Search	100 steps/second
Hyper Search	300 steps/second

To change the scanning speed, during scanning, press **SPEED** to switch between normal and hyper scan speeds. **SCAN** flashes on the display during hyper scan speed.

Notes:

- You can also change the search speeds when you listen to the weather band.
- s or t flashes on the display during high speed search.

To change the search speed, during a limit or direct search, press **SPEED** to switch between the normal and high speed search speeds. s or t flashes on the display during high speed search.

To select the hyper search speed, during a limit or direct search, press **PRI/HYPER SEARCH. SEARCH** flashes on the display during hyper search speed.

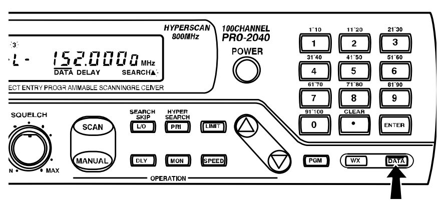
Note: You can use hyper search speed only in 5 kHz-step bands.

DETECTING DATA SIGNALS

You can set the scanner to detect data signals (nonmodulated signals such as preamble signals for pagers) during a limit or direct search.

Note: You cannot detect data signals in the air band (AM mode).

To detect data signals, press **DATA** so **DATA** appears on the display. If the scanner momentarily pauses on a transmission and detects a data signal, it resumes searching in 2 or 3 seconds.



To stop detecting data signals, press **DATA** so **DATA** disappears from the display.

A GENERAL GUIDE TO SCANNING

Reception of the frequencies covered by your scanner is mainly “line-of-sight.” That means you usually cannot hear stations that are beyond the horizon. During the summer months, you might be able to hear stations in the 30-50 MHz range located several hundred or even thousands of miles away. This is because of summer atmospheric conditions. This type of reception is unpredictable but often very interesting!

GUIDE TO FREQUENCIES

National Weather Frequencies

161.650 162.440
162.525
161.775 162.450
162.550
162.400 162.475
163.275
162.425 162.500

Ham Radio Frequencies

Ham operators often transmit emergency information when other communication methods break down. The following chart shows the frequencies that Hams use:

Wavelength (meters)	Frequency (MHz)
10-meter	28.000–29.700
6-meter	50.000–54.000
2-meter	144.000–148.000
70-cm	420.000–450.000

GUIDE TO THE ACTION BANDS

International Broadcast Bands

Several shortwave bands are allocated for international broadcasting because of the nature of propagation of high frequencies. The bands are sometimes identified according to the approximate wavelength of the signals in meters.

Typical Band Usage

HF Band (3.00–30.0 MHz)	
10-Meter Amateur Band	29.00–29.70 MHz
High Range	29.70–29.90 MHz
VHF Band (30.00–300.0 MHz)	
Low Range	30.00–50.00 MHz
6-Meter Amateur	50.00–54.00 MHz
Aircraft	108.00–136.00 MHz
U.S. Government	138.00–144.00 MHz
2-Meter Amateur	144.00–148.00 MHz
High Range	148.00–174.00 MHz
UHF Band (300.00 MHz–3.0 GHz)	
U. S. Government	406.00–420.00 MHz
0.6-Meter Amateur	420.00–450.00 MHz
Low Range	450.00–470.00 MHz
FM-TV Audio Broadcast, Wide Band	470.00–806.00 MHz
Conventional Systems	851.00–856.00 MHz
Conventional/Trunked Systems	856.00–861.00 MHz
Trunked Systems	861.00–866.00 MHz
Public Safety	866.00–869.00 MHz
Private Trunked	896.00–940.00 MHz
General Trunked	940.00–956.00 MHz

Primary Usage

As a general rule, most of the radio activity is concentrated on the following frequencies:

VHF Band

Activities	Frequencies
Government, Police, and Fire	153.785–155.980 MHz
Emergency Services	158.730–159.460 MHz
Railroad	160.000–161.900 MHz

UHF Band

Activities	Frequencies
Land-Mobile “Paired” Frequencies	450.000–470.000 MHz
Base Stations	451.025–454.950 MHz
Mobile Units	456.025–459.950 MHz
Repeater Units	460.025–464.975 MHz
Control Stations	465.025–469.975 MHz

Note: Remote control stations and mobile units operate at 5 MHz higher than their associated base stations and relay repeater units.

Specified Intervals

Frequencies in different bands are accessible only at specific intervals.

For example:

Band Type	Specified Interval
VHF, HAM, and Government	5.0 kHz steps
All Others	12.5 kHz steps
Aircraft	25.0 kHz steps

Note: Your scanner rounds the entered frequency to the nearest valid frequency. For example, if you try to enter 151.473, the scanner accepts this as 151.475.

Band Allocation

To help decide which frequency ranges to search, use the following listing of the typical services that use the frequencies your scanner receives. These frequencies are subject to change, and might vary from area to area. For a more complete listing, refer to the “Police Call Radio Guide Including Fire and Emergency Services,” available at your local Radio Shack store.

Abbreviations

AIR . . . . Aircraft
BIFC . . . . Boise (ID) Interagency Fire Cache
BUS . . . . Business
CAP . . . . Civil Air Patrol
CB . . . . Citizens Band
CCA . . . . Common Carrier
CSB . . . . Conventional Systems
CTSB . . . . Conventional/Trunked Systems
FIRE . . . . Fire Department
HAM . . . . Amateur (Ham) Radio
GOVT . . . . Federal Government
GMR . . . . General Mobile Radio
GTR . . . . General Trunked
IND . . . . Industrial Services
(Manufacturing, Construction, Farming, Forest Products)
MAR . . . . Military Amateur Radio
MARI . . . . Maritime Limited Coast
(Coast Guard, Marine telephone,
Shipboard Radio, Private stations)
MARS . . . . Military Affiliate Radio System
MED . . . . Emergency/Medical Services
MIL . . . . U.S. Military
MOV . . . . Motion Picture/Video Industry
NEW . . . . New Mobile Narrow
NEWS . . . . Relay Press (Newspaper reporters)
OIL . . . . Oil/Petroleum Industry
POL . . . . Police Department
PUB . . . . Public Services
(Public Safety, Local Government, Forestry Conservation)
PSB . . . . Public Safety
PTR . . . . Private Trunked
ROAD . . . . Road & Highway Maintenance
RTV . . . . Radio/TV Remote Broadcast Pickup
TAXI . . . . Taxi Services
TELB . . . . Mobile Telephone
(Aircraft, Radio Common Carrier, Landline companies)
TELC . . . . Cordless Phones
TELM . . . . Telephone Maintenance
TOW . . . . Tow Trucks
TRAN . . . . Transportation Services
(Trucks, Tow Trucks, Buses, Railroad, Other)
TSB . . . . Trunked Systems
TVn . . . . FM-TV Audio Broadcast
USXX . . . . Government Classified
UTIL . . . . Power & Water Utilities
WTHR . . . . Weather

High Frequency (HF)—(3 MHz–30 MHz)

10-Meter Amateur Band—(28.0-29.7 MHz)

29.000–29.700 . . . . HAM

Very High Frequency (VHF)—(30 MHz-300 MHz)

Low Band—(29.7–50 MHz—in 5 kHz steps)

29.700–29.790 . . . . IND
29.900–30.550 . . . . GOVT, MIL
30.580–31.980 . . . . IND, PUB
32.000–32.990 . . . . GOVT, MIL
33.020–33.980 . . . . BUS, IND, PUB
34.010–34.990 . . . . GOVT, MIL
35.020–35.980 . . . . BUS, PUB, IND, TELM
36.000–36.230 . . . . GOVT, MIL
36.250 . . . . Oil Spill Clean up
36.270–36.990 . . . . GOVT, MIL
37.020–37.980 . . . . PUB, IND
38.000–39.000 . . . . GOVT, MIL
39.020–39.980 . . . . PUB
40.000–42.000 . . . . GOVT, MIL, MARI
42.020–42.940 . . . . POL
42.960–43.180 . . . . IND
43.220–43.680 . . . . TELM, IND, PUB
43.700–44.600 . . . . TRAN
44.620–46.580 . . . . POL, PUB
46.600–46.990 . . . . GOVT, TELC
47.020–47.400 . . . . PUB
47.420 . . . . American Red Cross
47.440–49.580 . . . . IND, PUB
49.610–49.990 . . . . MIL, TELC

6-Meter Amateur Band—(50-54 MHz)

50.00–54.00 . . . . HAM

Land Mobile Service Band (72–76 MHz)

FM Radio Broadcast, Wide Band (88–108 MHz)

Aircraft Band (108–136 MHz)

108.000–121.490 . . . . AIR
121.500 . . . . AIR Emergency
121.510–136.000 . . . . AIR

U.S. Government Band (138–144 MHz)

137.000–144.000 . . . . GOVT, MIL

2-Meter Amateur Band (144–148 MHz)

144.000–148.000 . . . . HAM

VHF-Hi Band (148–174 MHz)

148.050–150.345	CAP, MAR, MIL
150.775–150.790	MED
150.815–150.965	TOW
150.980	Oil Spill Clean up
150.995–151.130	ROAD
151.145–151.475	POL
151.490–151.955	IND, BUS
151.985	TELM
152.0075	MED
152.030–152.240	TELB
152.270–152.465	IND, TAXI
152.480	BUS
152.510–152.840	TELB
152.870–153.020	IND, MOV
153.035–153.725	IND, OIL, UTIL
153.740–154.445	PUB, FIRE
154.490–154.570	IND, BUS
154.585	Oil Spill Clean-Up
154.600–154.625	BUS
154.655–156.240	MED, ROAD, POL, PUB
156.255	OIL
156.275–157.425	MARI
157.450	MED
157.470–157.515	TOW
157.530–157.725	IND, TAXI
157.740	BUS
157.770–158.100	TELB
158.130–158.460	BUS, IND, OIL, TELM, UTIL
158.490–158.700	TELB
158.730–159.465	POL, PUB, ROAD
159.480	OIL
159.495–161.565	TRAN
161.580	OIL
161.600–162.000	MARI, RTV
162.0125–162.35	GOVT, MIL, USXX
162.400–162.550	WTHR
162.5625–162.6375	GOVT, MIL, USXX
162.6625	MED
162.6875–163.225	GOVT, MIL, USXX
163.250	MED
163.275–166.225	GOVT, MIL, USXX
166.250	GOVT, RTV, FIRE
166.275–169.400	GOVT, BIFC
169.445	Wireless Mikes
169.500	GOVT
169.505	Wireless Mikes
169.55–169.9875	GOVT, MIL, USXX
170.000	BIFC
170.025–170.150	GOVT, RTV, FIRE
170.175–170.225	GOVT
170.245–170.305	Wireless Mikes
170.350–170.400	GOVT, MIL
170.425–170.450	BIFC

170.475 . . . . PUB
170.4875-173.175 . . . . GOVT, PUB, Wireless Mikes
173.225–173.375 . . . . MOV, NEWS, UTIL
173.3875–173.5375 . . . . MIL
173.5625–173.5875 . . . . MIL Medical/Crash Crews
173.60–173.9875 . . . . GOVT

Ultra High Frequency (UHF)—(300 MHz–3 GHz)

U. S. Government Band (406–450 MHz)

406.125–419.975 . . . . GOVT, USXX

70-cm Amateur Band (420–450 MHz)

420.000–450.000 . . . . HAM

Low Band (450–470 MHz)

450.050–450.925 . . . . RTV
451.025–452.025 . . . . IND, OIL, TELM, UTIL
452.0375–453.00 . . . . IND, TAXI, TRAN TOW, NEWS
453.0125–453.9875 . . . . PUB
454.000 . . . . OIL
454.025–454.975 . . . . TELB
455.050–455.925 . . . . RTV
457.525–457.600 . . . . BUS
458.025–458.175 . . . . MED
460.0125–460.6375 . . . . FIRE, POL, PUB
460.650–462.175 . . . . BUS
462.1875–462.450 . . . . BUS, IND
462.4625–462.525 . . . . IND, OIL, TELM, UTIL
462.550–462.725 . . . . GMR
462.750–462.925 . . . . BUS
462.9375–463.1875 . . . . MED
463.200–467.925 . . . . BUS

FM-TV Audio Broadcast, UHF Wide Band (470–512 MHz)
(Channels 14 through 69 in 6 MHz steps)

475.750 . . . . Channel 14
481.750 . . . . Channel 15
487.750 . . . . Channel 16
. .
. .
. .
805.750 . . . . Channel 69

Note: Some cities use the 470–512 MHz band for land/mobile service.

Conventional Systems Band—Locally Assigned

851.0125–855.9875 . . . . CSB

Conventional/Trunked Systems Band—Locally Assigned

856.0125–860.9875 . . . . CTSB

Trunked Systems Band—Locally Assigned

861.0125–865.9875 .... TSB

Public Safety Band—Locally Assigned

866.0125–868.9875 .... PSB

Common Carrier

869.010–894.000 .... CCA

Private Trunked

935.0125–939.9875 .... PTR

General Trunked

940.0125–940.9875 .... GTR

FREQUENCY CONVERSION

The tuning location of a station can be expressed in frequency (kHz or MHz) or in wavelength (meters). The following information can help you make the necessary conversions.

1 MHz (million) = 1,000 kHz (thousand)

To convert MHz to kHz, multiply by 1,000:

$$9.62 \text{ MHz} \times 1000 = 9620 \text{ kHz}$$

To convert from kHz to MHz, divide by 1,000.

$$2780 \text{ kHz} \div 1000 = 2.780 \text{ MHz}$$

To convert MHz to meters, divide 300 by the number of megahertz.

$$300 \div 7.1 \text{ MHz} = 42.25 \text{ meters}$$

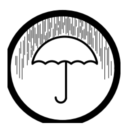
TROUBLESHOOTING

Your Radio Shack PRO-2040 100-Channel Programmable Home Scanner should require very little maintenance. If you have problems, refer to this chart for possible solutions. If you cannot solve the problem, contact your local Radio Shack store for assistance.

Problem	Probable Cause	Solution
Scanner is totally inoperative.	The AC or DC adapter is not properly connected.	Be sure the adapter is fully inserted into the **DC 12V** jack and into a working AC or DC power source receptacle
The display dims.	The AC or DC adapter does not provide the required 12 volts DC.	Be sure the adapter is set to provide no less than 12 volts DC.
The scanner turns on, but does not scan.	The **SQUELCH** control is not correctly adjusted.	Adjust the **SQUELCH** control clockwise (see "Turning On the Scanner/Setting the Volume and Squelch").
In the scan mode, the scanner locks on frequencies that have an unclear transmission.	You have programmed a "Birdie" frequency.	Avoid programming frequencies listed under "Finding Birdie Frequencies," or only select them manually.
Poor or no reception.	Improperly connected antenna. Programmed frequencies are the same as Birdie frequencies. The environment is not suitable for reception by the scanner.	Be sure the antenna is properly connected. Avoid programming frequencies listed under "Finding Birdie Frequencies," or only select them manually. Relocate the scanner and try again.
Keys do not work or display changes at random.	Undetermined error. The CPU is locked up.	Reset or initialize the scanner (see "Resetting the Scanner's Display" and "Initializing the Scanner").
`Error` appears on the display.	Programming error.	Reprogram the frequency correctly.

CARE AND MAINTENANCE

Your Radio Shack PRO-2040 100-Channel Programmable Home Scanner is an example of superior design and craftsmanship. The following suggestions will help you care for your scanner so you can enjoy it for years.



Keep the scanner dry. If it gets wet, wipe it dry immediately. Liquids might contain minerals that can corrode the electronic circuits.



Handle the scanner gently and carefully. Dropping it can damage circuit boards and cases and can cause the scanner to work improperly.



Use and store the scanner only in normal temperature environments. Temperature extremes can shorten the life of electronic devices and distort or melt plastic parts.



Keep the scanner away from dust and dirt, which can cause premature wear of parts.



Wipe the scanner with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the scanner.

Modifying or tampering with the scanner’s internal components can cause a malfunction and might invalidate your scanner’s warranty and void your FCC authorization to operate it. If your scanner is not performing as it should, take it to your local Radio Shack store for assistance.

SPECIFICATIONS

Frequency Coverage:

VHF-Lo .... 29-50 MHz (in 5 kHz steps)
Ham .... 50-54 MHz (in 5 kHz steps)
Aircraft .... 108-136.975 MHz (in 12.5 kHz steps)
Government .... 137-144 MHz (in 5 kHz steps)
Ham .... 144-148 MHz (in 5 kHz steps)
VHF-Hi .... 148-174 MHz (in 5 kHz steps)
Ham/Government .... 406-450 MHz (in 12.5 kHz steps)
UHF-Standard .... 450-470 MHz (in 12.5 kHz steps)
UHF-T (Television) .... 470-512 MHz (in 12.5 kHz steps)
UHF-Hi .... 806.0000 - 823.9375 MHz (in 12.5 kHz steps)
UHF-Hi .... 851.0000 - 868.9375 MHz (in 12.5 kHz steps)
UHF-Hi .... 896.1125 - 956 MHz (in 12.5 kHz steps)

Channels of Operation .... Any 100 channels in any band combinations

Sensitivity:

AM: 20 dB Signal-to-Noise Ratio at 60% modulation
108-136.975 MHz .... 1.5 µV

FM:20 dB Signal-to-Noise Ratio at 3 kHz deviation
29-54 MHz .... 0.5 µV
137-174 MHz .... 0.7 µV
406-512 MHz .... 0.5 µV
806-956 MHz .... 1.0 µV

Selectivity:

±11 kHz .... -6 dB
±15 kHz .... -50 dB

Scanning Rate:

Normal .... 12 channels/sec
Hyper .... 50 channels/sec

Search Speed:

Normal .... 50 steps/sec
High .... 100 steps/sec
Hyper .... 300 steps/sec (only 5 kHz step band)

WX Scanning Rate:

Normal .... 12 frequencies/sec
High .... 50 frequencies/sec

Delay Time .... 2 Seconds

IF Frequencies	10.8 MHz and 450 kHz
Antenna Impedance	50 Ohms
Audio Power	1.3 Watts maximum
Built-In Speaker	$2^1/_4$-Inch (57 mm), 8-ohm, dynamic type
Power Requirements	AC 120 Volts, 60 Hz
Current Drain	DC 240 mA (squelched) DC 400 mA (full volume unsquelched)
Dimensions	$2^3/_4 \times 7^7/_8 \times 7^3/_4$ Inches (HWD) 70 x 200 x 195 mm
Weight	1.4 lbs (640 g)

Specifications are typical; individual units might vary. Specifications are subject to change and improvement without notice.

NOTES

RADIO SHACK LIMITED WARRANTY

This product is warranted against defects for 1 year from date of purchase from Radio Shack company-owned stores and authorized Radio Shack franchisees and dealers. Within this period, we will repair it without charge for parts and labor. Simply bring your Radio Shack sales slip as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse or accidental damage.

EXCEPT AS PROVIDED HEREIN, RADIO SHACK MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

We Service What We Sell *9/94*

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